



Impact of Artificial Intelligence on Indian Banking Sector-A Case Study of Select Banks in Hyderabad

Author 1: Akhilesh Bavandlapalli

Research Scholar
Department of Commerce UCC & BM
Osmania University Hyderabad

Author 2 Dr. Nazia Sultana

Associate Professor Department of Commerce
University College for Women, Koti Osmania University
Hyderabad

Abstract:

Today's very competitive corporate climate, AI is finding widespread use in many industries. This pattern is likely to persist. The competition in the business world is driving this trend toward more specialization. The financial services industry is a prime example of this phenomenon. This is especially true in the commercial and financial spheres of the corporate world. Since the advent of AI and the many advantages it provides, banks and other financial organizations have been compelled to reevaluate their strategies and incorporate AI-based innovations. The use of block chain technology is one method through which this has been achieved. This has prompted a rise in AI-powered technological advances across the banking sector. This is only one of many direct consequences that have resulted from the development of AI. The use of block chain technology is one strategy that has proven effective for this goal. Because of the universal approval it has received in the banking sector, more and more banks have gone online, cash flow has been kept constant, and centralized financial arrangements have been established. To do this, we shall compile data from several resources. The project also aims to determine what role, if any, artificial intelligence may have in the aforementioned procedures. Any supplementary data for the study may have come from reputable annual reports, research papers, or books. The data was then analyzed quantitatively using techniques including the paired sample t-test, canonical correlation, and multiple regression. The results of these examinations and analyses were then interpreted.

Keywords: Banking Performance, Artificial Intelligence,

INTRODUCTION

Recent developments in the financial industry, such as central banking and payment systems, have helped improve the effectiveness of risk management. These shifts might be seen. These new findings may turn out

to have a positive impact. These shifts have been increasingly pronounced during the last several years. It's very feasible that the organization will make significant progress because of everything that's been happening and advancing. These kinds of developments may be seen in any of these many centers of interest and activity. Such front- and back-end upgrades are now

in development, and each offers solutions to issues that were previously handled by the finance department or the board of directors. They are also being developed for front- and back-end applications. Recently, the notion of constructing an artificial consciousness by the use of computer programming has attracted a lot of attention in the area of business management accounting. The attention paid to this problem has skyrocketed in recent years. Research in this field of study focuses mainly on the ties that establish between the various company kinds and the clients they service. High hopes are being placed in artificial intelligence (AI), and its reception is being viewed as the fourth major uprising of our time. As with any major technological advancement, it comes with its own set of advantages and disadvantages. There are some applications out there or in development that could change the way administration is done. Microsoft India predicts that by 2023, AI will be the single most important driving force in accelerating the rate of innovation-driven value enhancements (by 2.2 times) and worker usefulness benefits (by 2.3 times). The value of artificial intelligence innovations has skyrocketed as their development has accelerated. After demonetization, the Indian banking sector aggressively embraced AI technology. AI is being used in the financial sector, as well as its suggestions and affects on the financial execution of some public and private sector business banks in India with respect to revenue pay.

Review of Literature

Artificial intelligence (AI) has revolutionized several fields, and the banking industry is no exception. The purpose of this literature review is to present a synopsis of the available studies that examine the effects of AI on the Indian banking industry, with a particular emphasis on a few banks in the city of Hyderabad. This research dives at the impact that AI has had on customer service, productivity, safety, and long-term planning in the Indian banking industry. The use of chatbots and virtual assistants driven by artificial intelligence has revolutionized customer support in the financial sector. Mishra et al. (2019) found that chatbots powered by artificial intelligence improved consumer engagement by responding quickly to questions and helping with purchases. In addition, research shows that customizing services to each individual client is now possible thanks to AI-enabled customized suggestions and predictive analytics (Rani et al., 2020).

The application of AI to automate mundane jobs has increased operational efficiency in financial institutions. Artificial intelligence (AI) algorithms have improved back-office processes by eliminating human mistake and speeding up processing times, as highlighted by Chavan and Deshmukh (2018). Also, AI's speedy data processing has improved fraud detection and prevention methods (Prasad et al., 2021). Banking risk assessment and management have been revolutionized by AI's predictive skills. Credit scoring methods have been enhanced by artificial intelligence algorithms that analyze non-traditional data sources, as stated by

Singh and Kapoor (2020). As a result, banks may now provide loans to previously undeserved groups. In addition, anomaly detection systems powered by AI have improved fraud detection by quickly spotting out-of-the-ordinary trends (Verma et al., 2019). Banks may now make more data-driven decisions thanks to AI-powered analytics. Market trends, consumer behavior, and economic indicators may all be analyzed by AI algorithms, as shown by Kumar and Reddy's (2017) study, leading to improved strategic planning. This has allowed financial institutions to develop more efficient advertising strategies and new products. Study of Selected Banks in Hyderabad There are few studies that have examined the effects of AI on the banking industry in Hyderabad. Case studies done by Prof. Crysolyte (2022) on two large banks in Hyderabad reveal that the use of AI has enhanced customer satisfaction, decreased response times, and opened up new avenues for cross-selling.

Statement of Problem:

Given the massive amounts of data that come with the operational financial framework, it is currently considered excessive to make a decision. This occurs because there is either insufficient data or incorrect data on the organizational structure. This is so because the choice will be informed by the data collected. This is because the referenced data already exists at the specified location. The AI system will anticipate these problems and react accordingly by sifting through data in order to handle the reports efficiently. It achieves this purpose by making use of real-time data, which enables timely decisions and facilitates management in accordance with the principles and rules.

Objectives of Research:

- 1 To study the aim of cataloging the many uses of AI in the banking sector.
- 2 To analyze the impact that AI has on the efficient execution of economic plans.
- 3 To determine if or not there is a correlation between the usage of AI and the interest income of certain banks.

Techniques and Methodology:

Numerous research methods, both descriptive and explanatory, were used over the course of this examination. Secondary data were collected from reliable sources like financial institutions' annual reports for this investigation. We used the data from these publications. The study in question was conducted in the India. The articles were only one of several sites we

mined for information; the sources themselves were rather diverse. We used statistical methods including the Paired Samples T-Test, Correlation analysis, and Regression analysis to check the data and make sure it was correct.

Research Hypothesis:

H₀: No statistically significant correlation was found between the percentage of banks using AI and their percentage of interest income.

H₁: The percentage of banks using AI is correlated with the interest income of the selected banks.

Discussions Based on Empirical Findings

Analysis and Content

The 8-Parameters of AI included in this assessment were selected from among those made public in the sample bank's annual report. Those that implemented the selected AI border into their daily company operations get a 1 from the banks, while those who did not receive a score of 1 are disqualified.

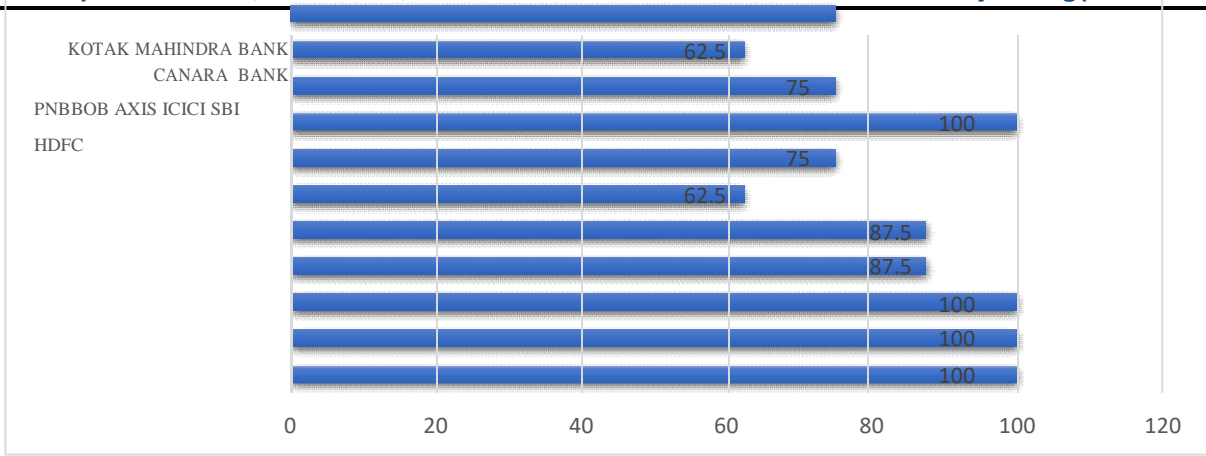
Parameter of Artificial Intelligence:

Artificial Intelligence Parameter	No
Customer Interface	I
Customized Financial service	II
Digitalization of Branch	III
Business Strategy Insights	IV
Data Driven- Lending Decision	V
Fraud detection	VI
Robotic Process Automation	VII
VRM	VIII

Artificial Intelligence Score:

Name of the Bank	I	II	III	IV	V	VI	VII	VIII	Total	Normalised Score
HDFC	1	1	1	1	1	1	1	1	8	100
SBI	1	1	1	1	1	1	1	1	8	100
ICICI	1	1	1	1	1	1	1	1	8	100
AXIS	1	1	1	1	1	1	0	1	7	87.5
BOB	1	1	1	1	1	1	1	0	7	87.5
PNB	1	0	1	1	1	1	0	0	5	62.5
CNB	1	0	1	1	1	1	1	0	6	75
KMB	1	1	1	1	1	1	1	1	8	100
BOI	1	1	1	1	1	1	0	0	6	75
UBI	1	1	1	0	1	1	0	0	5	62.5
FB	1	0	1	1	1	1	0	1	6	75
IB	1	0	1	1	1	1	0	0	5	62.5
IOB	1	0	1	0	1	1	1	0	5	62.5
UCO	1	1	1	0	1	1	0	0	5	62.5
CBI	1	0	1	0	1	1	1	1	6	75
IDBI	1	0	1	1	1	1	1	0	6	75

IDBI	75
CENTRAL BANK	75
UCO BANK	
IOB	62.5
INDIAN BANK	62.5
FEDERAL BANKUNION	62.5
BANK	
BOI	75



According to the data presented in the table and chart above, four of the model banks rely entirely on electronic thought for their business operations, two rely on human knowledge for 87.5% of their tasks, five rely on human intelligence for 75%, and six rely on mechanized thought for only 62.5%. As a result, it's clear that banks are increasingly relying on AI-generated data in their daily operations.

Paired Sample T-Test

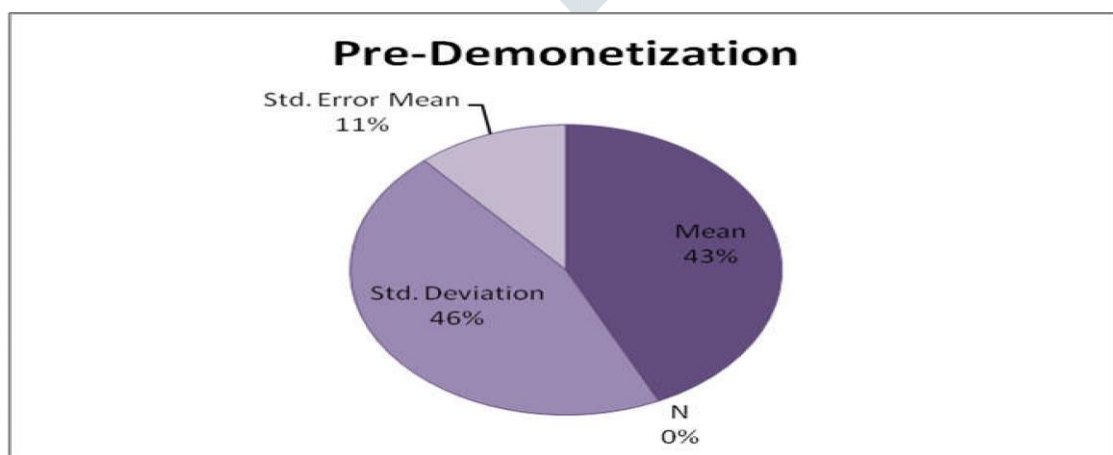
Null Hypothesis (H0): When comparing interest income, there is no difference.

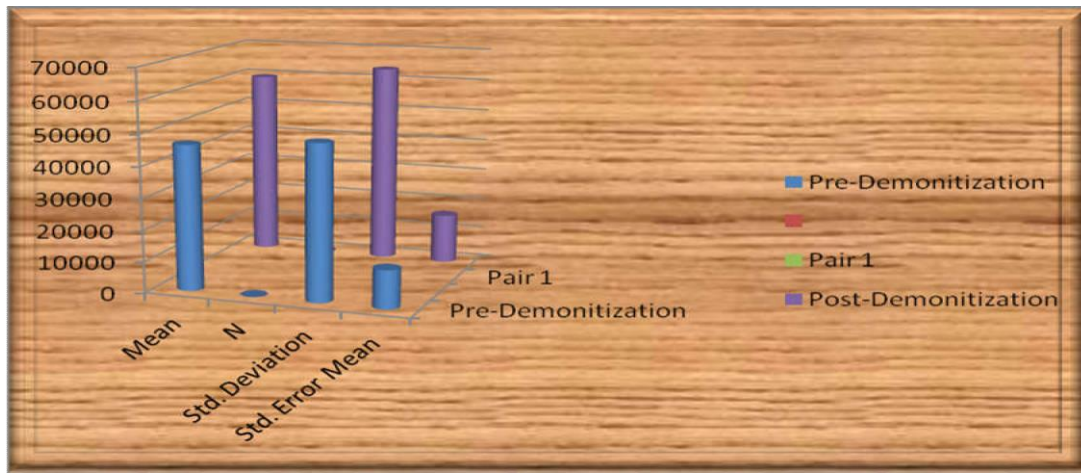
Alternative Hypothesis (H1): The Interest Income Gap here is negative and not equal to zero.

Comparing Interest Payments Before and After Demonetization Using a Paired Samples T-Test
Statistics for Paired Samples

	Mean	N	Std. Deviation	Std. Error Mean
Pre-Demonetization	46397.44	16	49375.335	12343.834
Pair 1				
Post-Demonetization	59390.69	16	63671.309	15917.827

According to the data shown above, the average value of interest payments made before and after the demonetization of currency is 46,397.44 and 59390.69, respectively. Interest payments clearly increase in value from before demonetization to after.

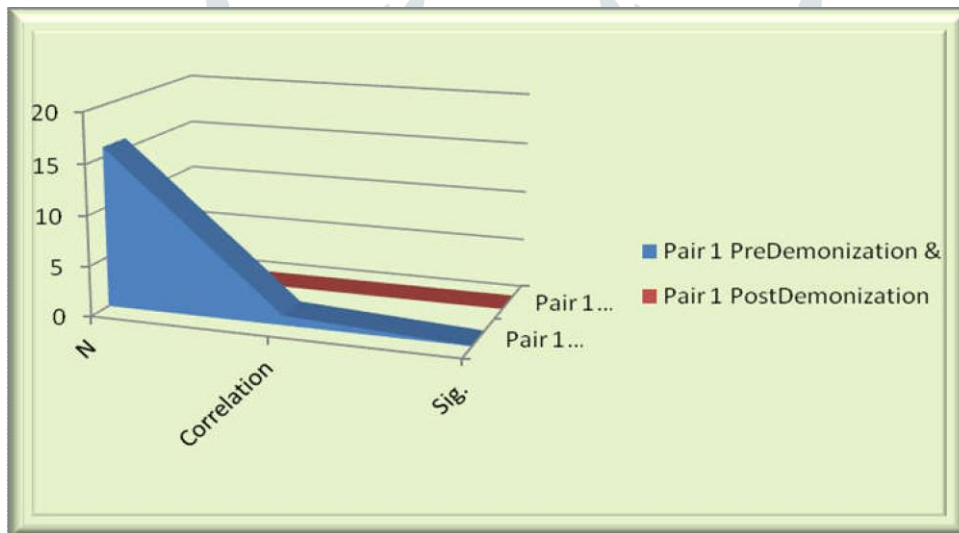




Paired Sample Correlations

Paired Samples Correlations

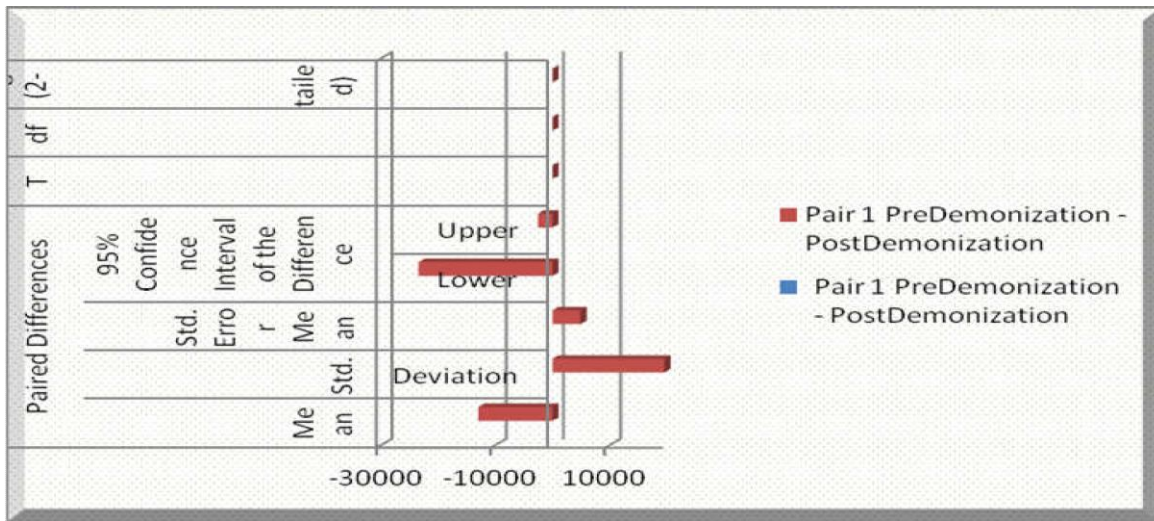
		N	Correlation	Sig.
Pair 1	Pre Demonization & Post Demonization	16	0.972	0.000



Based on the data in the table above, we can infer that the difference in interest income before and after demonetization has a significant positive link ($r = 0.972$). Since the 0.000 p-value obtained from the table is less than the threshold value of 0.05, ($=0.05 > p=0.000$) H_0 is rejected, showing that there is a significant difference between the Interest pay of Pre-Demonization and Post- Demonization.

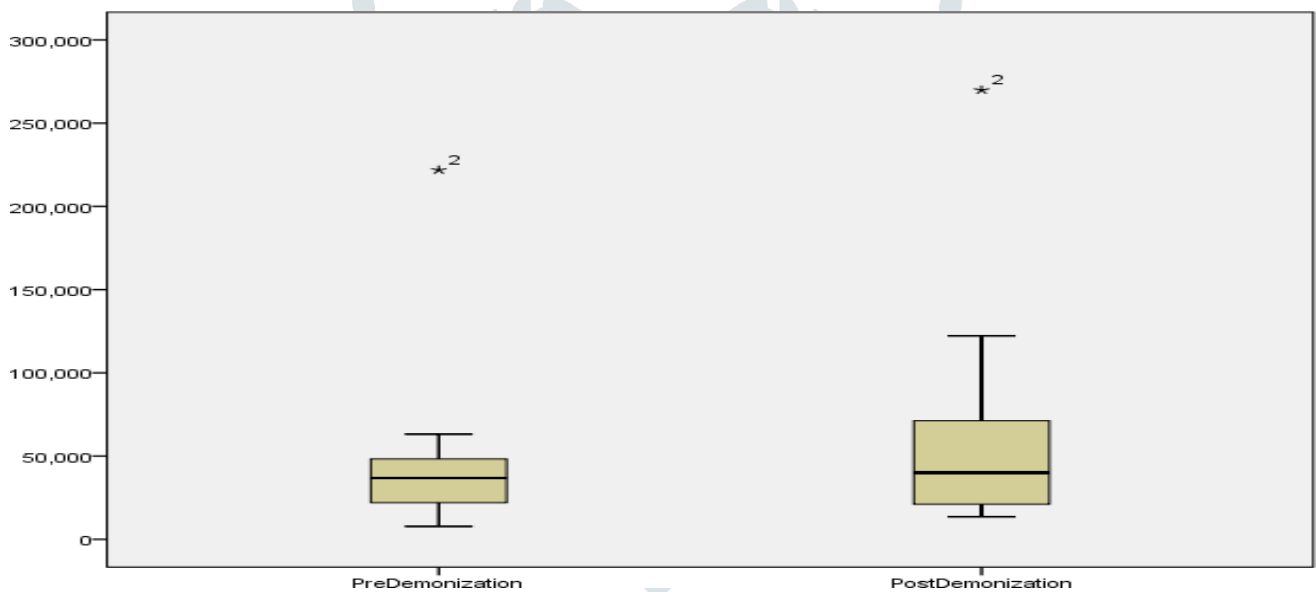
Paired Sample Test
Paired Samples Test

		Paired Differences					T	df	Sig. (2- tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair1	Pre Demonization –Post Demonization	-12993.250	19578.195	4894.549	-23425.734	-2560.766	2.655	15	0.018



The preceding table's Paired sample test mean value of - 12993.25 indicate that there is a typical difference between Interest paid before and after Demonetization. The p-value gained from the table is 0.018 which is lower than the significant value of 0.05, ($\alpha=0.05 > p=0.018$) reject the H0, which demonstrates there is a statistically significant difference between the Net pay of Pre- Demonetization and Post-Demonetization.

Paired Sample T-Test



The interest payments made after demonetization are dramatically higher than those made before. This also implies that pre- and post-Demonetization interest payments are separate.

ANALYSIS OF CORRELATION

Null Hypothesis (H0): There is no correlation between interest earnings and artificial intelligence rating.

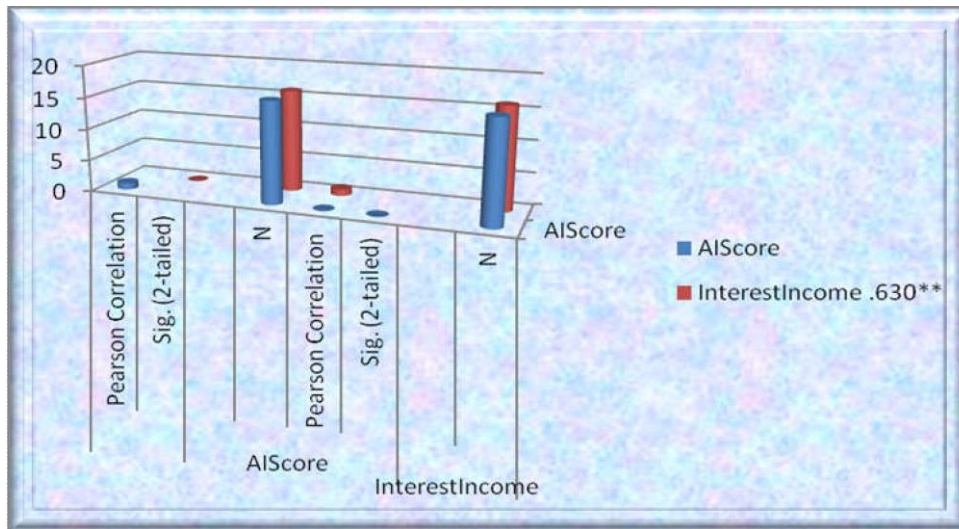
Alternative Hypothesis (H1): Interest earnings and the A.I. Score are statistically related.

Correlation analysis between AI and Interest Income of the selected banks

Correlations

		AI Score	Interest Income
AI Score	Pearson Correlation	1	0.630**
	Sig. (2-tailed)		0.009
	N	16	16
Interest Income	Pearson Correlation	0.630**	1
	Sig. (2-tailed)	0.009	
	N	16	16

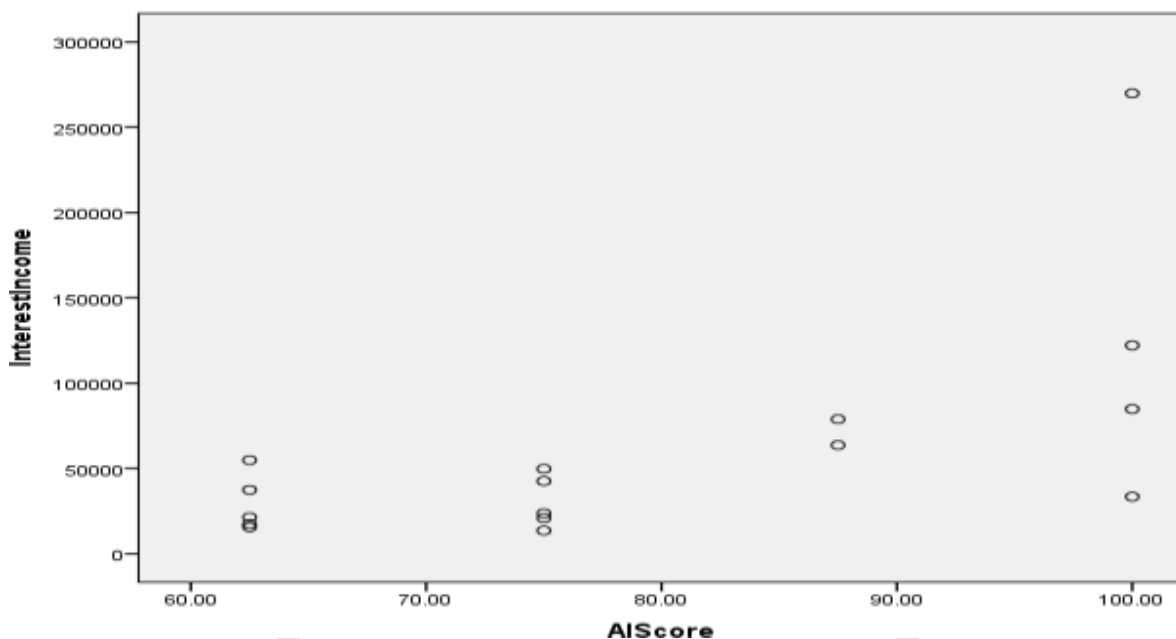
** . Correlation is significant at the 0.01 level (2-tailed).



From the above table, the Pearson correlation value 'r' is viewed as 0.630 which connotes that there is a moderate relationship between μ_1 and μ_2 . The variables are viewed as semantically connected (0.630), which implies that increment in one variable (μ_1) will in general expansion in another variable (μ_2).

The p-value got from the table is 0.009 which is lower than the significant value of 0.05, ($\alpha=0.05 > p=0.009$) rejects the H_0 , which demonstrates there is a statistically significant correlation between μ_1 and μ_2 .

Scatter plot of Artificial Intelligent Score and Interest Income:



The above Scatter plot shows that AI scores under 80 will gives interest pay of under 55000 crores andthe AI score over 80 will gives the net interest pay in excess of 55000 crores. It uncovers that use of Artificial Intelligence in their business activity and Interest pay has high connection between them.

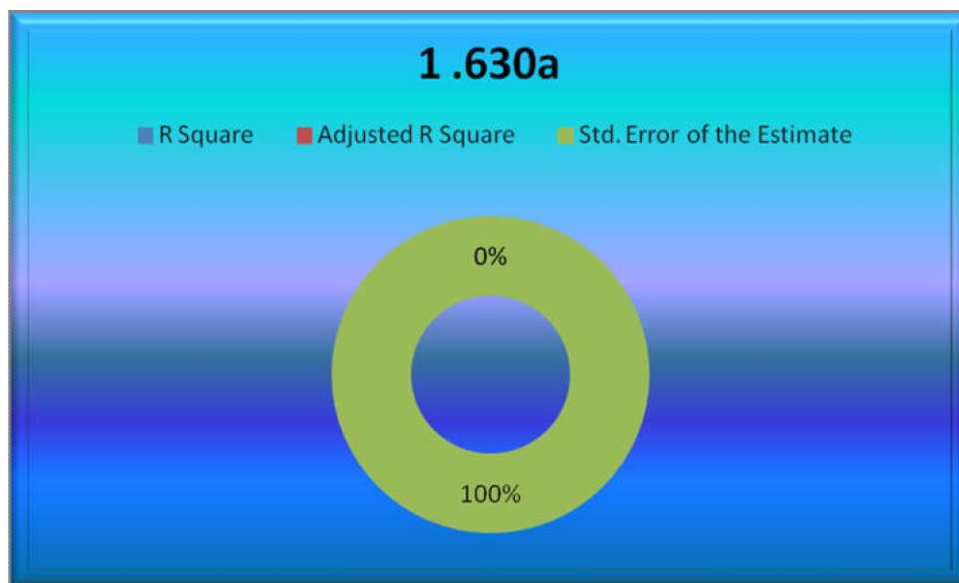
SIMPLE LINEAR REGRESSION ANALYSIS

Model Summary Simple Linear Regression analysis

Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.630 ^a	0.397	0.354	51172.212

a. Predictors: (Constant), AI Score



b. **Dependent Variable: Interest Income**

From the above table R-Value is viewed as 0.630, which indicates high degree of relationship between μ_1 and μ_2 . Also, the R^2 Value (0.397= 39.7%) shows that, the complete extent of change in the reliant variable (μ_2) by the autonomous variable (μ_1) is 39.7% which is medium.

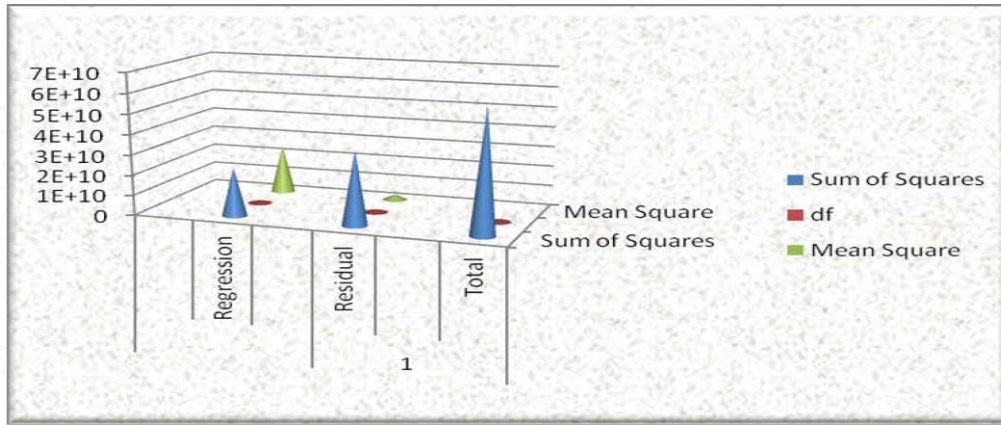
ANOVA

ANOVA result of Artificial Intelligence Usage Score and Interest income of the selectedbanks:

ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	24150200032.522	1	24150200032.522	9.223	0.009 ^b
1 Residual	36660334454.915	14	2618595318.208		
Total	60810534487.438	15			

- a. Dependent Variable: Interest Income
- b. Predictors: (Constant), Artificial Intelligence Score



The T-test analysis of the coefficient for the Artificial Intelligence Usage Score and Interest Income of the selected banks indicates the following: The coefficient result for the Artificial Intelligence Usage Score is 2685.117. This means that a one-unit increase in the Artificial Intelligence Usage Score leads to an estimated increase of 2686.982 in the Interest Income of the selected banks. In simpler terms, the coefficient suggests that there is a positive relationship between the usage of Artificial Intelligence and the Interest Income of the selected banks.

As the Artificial Intelligence Usage Score increases, the Interest Income is expected to increase as well. However, it's important to note that this interpretation is based solely on the coefficient and further analysis is needed to establish a causal relationship and consider other factors that may influence the Interest Income of the banks.

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-152481.860	70929.981	0.630	-2.150	0.050
1					
AI Score	2685.117	884.173		3.037	0.009 ^{**}

a. Dependent Variable: Interest Income

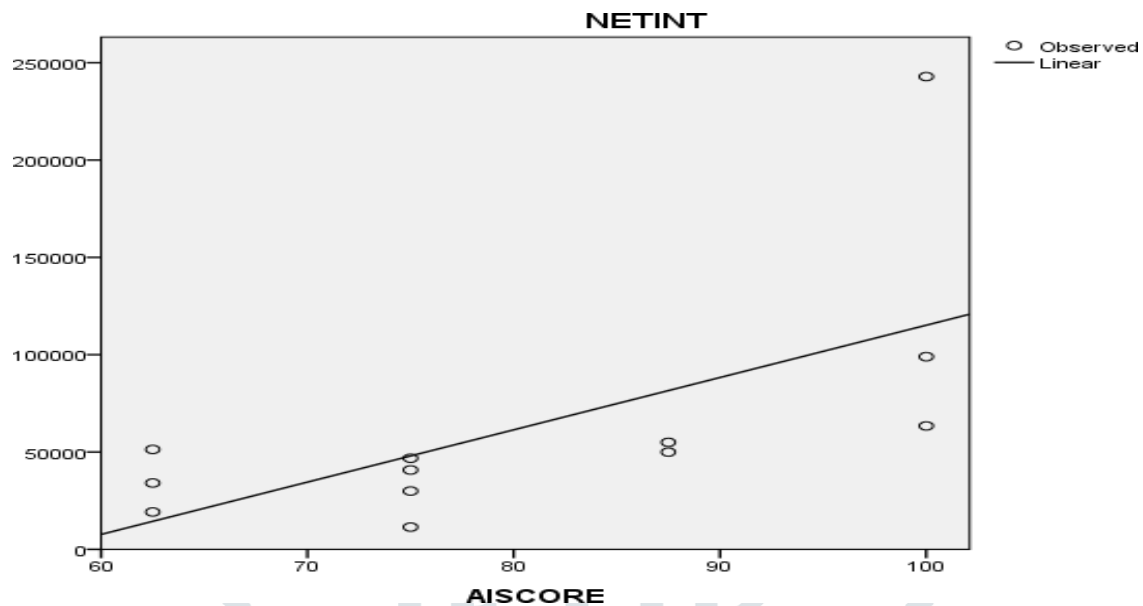
Interpretation:

Based on the provided information, the T-test yielded a significant value of 0.009, which is lower than the significance level of 0.05 ($\alpha=0.05 > p=0.025$). This indicates that the proposed regression model has a statistically significant predictive ability for the outcome variable. The B coefficient is calculated to be 2685.117, suggesting that a 1-unit increase in μ_1 results in a 2686.982 increase in μ_2 .

Regression Model

$$\text{Interest Income} = -152481.860 + 2686.982$$

$\mu_1 + \epsilon$ Simple Linear Regression



Conclusion & Implication Results

The financial industry may gain from artificial intelligence in several ways. In India, it is transforming how financial institutions interact with their clients. It is also used to check for fraud and determine a person's financial security. Business processes may be simplified, individualized services may be provided, and wider goals, such as financial inclusion, may be advanced via the use of artificial intelligence. More and more conventional banks are using cutting-edge technology like artificial intelligence (AI), cloud computing (Cloud), and blockchain to increase efficiency and save expenses. Progress in artificial intelligence will allow for more output with less input. It's certain that the continual move toward digitalization is having a profound effect on established monetary frameworks.

Improved Customer Experience: AI enables banks to offer personalized and proactive services to customers. Chatbots and virtual assistants powered by AI can provide instant and accurate responses to customer queries, offer tailored product recommendations, and deliver personalized financial advice.

Fraud Detection and Prevention: AI can analyze vast amounts of data in real-time to detect patterns and anomalies that may indicate fraudulent activities. Machine learning algorithms can continuously learn from new data and adapt to evolving fraud patterns, strengthening a bank's ability to prevent financial crimes.

Risk Management: AI-powered systems can analyze complex data sets, including market trends, customer behavior, and credit risk, to provide more accurate risk assessments. This helps banks in making informed decisions about lending, investment, and portfolio management, reducing potential risks.

Future Scope:

Compliance and Regulatory Support: Banks face stringent regulations and compliance requirements. AI can assist in automating compliance processes, ensuring adherence to regulations, and reducing the risk of non-compliance. Natural language processing capabilities can help analyze legal documents and extract relevant information for compliance purposes.

Data-driven Insights: AI algorithms can analyze vast amounts of data to generate actionable insights for banks. These insights can be used for predictive analytics, identifying market trends, customer segmentation, and optimizing business strategies.

Cost Reduction: By automating routine tasks and improving operational efficiency, AI can help banks reduce costs associated with manual labor and error correction. Additionally, AI can assist in identifying cost-saving opportunities and optimizing resource allocation.

Innovation and Product Development: AI enables banks to develop innovative financial products and services. For example, AI-powered robo-advisors can provide automated investment advice, and AI-driven credit scoring models can enhance the accuracy and speed of loan approvals.

References:

- 1 Mauro Castelli, Luca Manzoni, and Aleš Popovič (2016) An Artificial Intelligence System to Predict Quality of Service in Banking Organizations. Computational Intelligence and Neuroscience Volume 2016, 7-11.
- 2 Sindhu J, Renee Namratha (2019). Impact of Artificial Intelligence in chosen Indian Commercial Bank –A Cost Benefit Analysis.
- 3 <https://ajmjournal.com/HTMLPaper.aspx?Journal=Asian Journal of Management>.
- 4 Menon, R. (2018). AI: The next frontier for Indian banks. The Banker, 70. Retrieved from <https://search.proquest.com/docview/2098933155?accountid=131417>.
- 5 Ritu Tuli Sameer Salunkhe (2019). Role of Artificial Intelligence in Providing Customer Services with Special Reference to SBI and HDFC Bank International Journal of Recent Technology and Engineering (IJRTE) 12251-12260.
- 6 RBI Report on Data Warehousing, Data Mining and Management Information System, Chapter 6 (July 1999).
- 7 Dr. Munish Sabharwal (2014). The use of Artificial Intelligence (AI) based technological applications by Indian Banks. International Journal of Artificial Intelligence and Agent Technology 1-5.
- 8 <https://www.accenture.com/us-en/insight/artificial-intelligence-index><https://www.moneycontrol.com>.

- 9 Leenapriya De, (2020). Converging Artificial intelligence in Indian banking business- An overview. The management accountant journal. 81-84.
- 10 Dr. Simran Jewandah (2018). How Artificial Intelligence Is Changing The Banking Sector –A CaseStudy of top four Commercial Indian Banks. International Journal of Management, Technology and Engineering. 525-530.
- 11 M. Bhuvana, P. G. Thirumagal and S .Vasanth, (2016) Big Data Analytics - A LeveragingTechnology for Indian Commercial Banks, Indian Journal of Science and Technology, Vol 9.
- 12 Alzaidi.A.A, (2018). Impact artificial intelligence on performance of banking industry in Middle East. International Journal of computer science and Network security. 141-146.

